

phate of lime, and never to have received any back again; assuming this ingredient to have been continually exported in the shape of milk, cheese, sheep, and oxen, it is clear that unless the land had an unlimited amount of phosphate, which we know is not the case, there must have been a proportionate diminution in the quantity of such materials. Hence it is that when certain substances which had been taken out for a long period have been again suddenly applied, land worth hardly 5s. per acre has sprung up to the value of 15s., and there has been an enormous increase of crops."

One of the most valuable qualities of bones is the slowness with which they decompose, and the length of time during which they continue to give out the phosphates. It is found upon analysis that one pound of bones contains as much phosphoric acid as 28 pounds of wheat or of 250 pounds of potatoes. Now, a crop of wheat of four quarters per acre, and reckoning it at 60lbs. per bushel, weighs in round numbers, 2,000lbs., which contains only as much phosphate as is found in 71lbs. of bones. It is clear, therefore that if the bones are put on at the rate of $3\frac{1}{2}$ cwt. per acre, supposing them to decompose rapidly and give out the phosphates in proportion, a large proportion would be wasted. But that this is not the case the following circumstances prove. A gentleman, who occupied a large farm in Norfolk, finding, towards the close of his wheat sowing, that he was likely to have a considerable quantity of bone dust left, if he continued distributing it at the ordinary rate, directed his foreman to increase the quantity. On going to the field the following day he found that the man had *doubled* the allowance, and that instead of having any to spare, he would not at that rate, have enough to finish manuring the remaining seeding land. He therefore told him to go back to the usual quantity of about 1 cwt. per acre, at which rate the field was finished. The crop of wheat proved a very heavy one, as well as the succeeding crop of turnips, on that part of the land which was thus doubly dosed with bone dust. Now mark what follows. *Eleven years after*, the farmer on riding with a friend over his land, came to this field, which was again, for the third time after the above occurrence, under wheat. On entering it, he requested his friend, if he should, in riding down the furrow, find any difference in the growth of the wheat, to point it out. After riding a few yards into the wheat he suddenly stopped. "What in all the world have you been after here?" he exclaimed. "This wheat is six inches higher, and as stout again as the rest; how came this to pass? The farmer then explained to him the occurrence we have related and which proves not only the value of bones as a manure for a single crop, but that by the deliberate manner in which they give out the phosphates in decomposition, they possess a more permanent value than any other kind of manure.

But bones are not only valuable on account of the phosphoric acid they contain: they also contain nitrogen in the proportion, according to some chemists, of six, and of others of four per cent. As the bones decompose this becomes ammonia, the value of which in manure is now well understood by almost all agriculturists. The conversion of bones into superphosphate of lime by the addition of sulphuric acid, by precipitating the decomposition, probably alters the conditions, by causing the immediate distribution of the phosphoric acid in the soil; and thence it requires a less quantity to be applied to the land to produce a crop. The Americans have adopted a new method of dissolving bones, which may probably be employed to advantage in this country, as the bones will not require to be ground. A ley is made with lime, in the proportion of one bushel of lime to six gallons of water. To two hundred pounds of bones put sixty gallons of this ley, and boil them for a few hours until the bones are dissolved, when they may be reduced to a dry powder, and applied in the same way as guano or any other artificial manure. This mode of application has been found to produce very satisfactory results. The lime used was made of oyster shells, as the best for the purpose. "It has been repeatedly demonstrated," says an American writer, "that one bushel of dissolved bones, for immediate effect, is equal to five times as much ground bones; in other words that one pound of *normal* or soluble phosphate of lime, is worth more than five pounds of *normal*, or natural phosphate of lime, or bone-earth." This economic application of bones is becoming more and more common, being cheaper, and involving less labour; and the result is quite as certain and as good. The only difficulty in the purchase of bones, in whatever form, is that of getting them genuine on account of the adulteration with *scutch*, or the refuse of the tanpits, oyster-shells, and other cheap ingredients, the proportion of which bones is regulated, with some dealers, by the price paid per ton. We have known as much as 50 per cent. of *scutch* mixed with bones agreed on between the merchant and his customer, a country bone crusher.

The Cultivation of Tares.

FOR THE AGRICULTURIST.—In the *Agriculturist* for March 16th, there is an article on the culture of vetches, or tares, (for the terms synonymous) in which you say you shall be happy to hear from such of your readers as have had practical experience with them. We have been in the habit of growing them on a small scale for many years, and may say that we look upon them as a green or fallow crop, and sow them in the same field with our green crops.

In preparing land for tares, we think the